



FATIMA JINNAH WOMEN UNIVERSITY
Department of Software Engineering

SOFTWARE CONSTRUCTION AND DEVELOPMENT LAB

Lab 02

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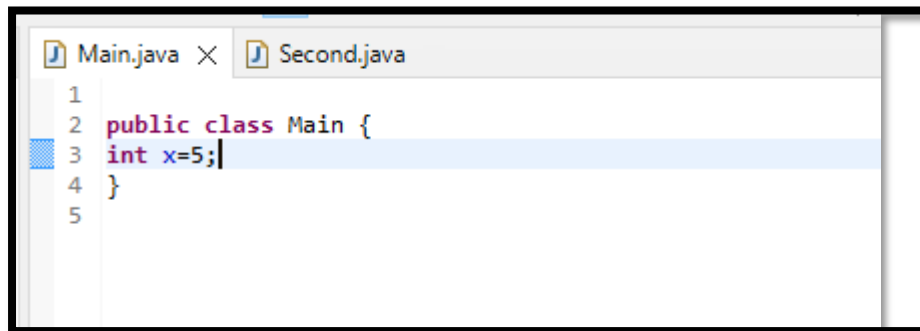
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Roll no :2021-BSE-032

Section : BSE 5A

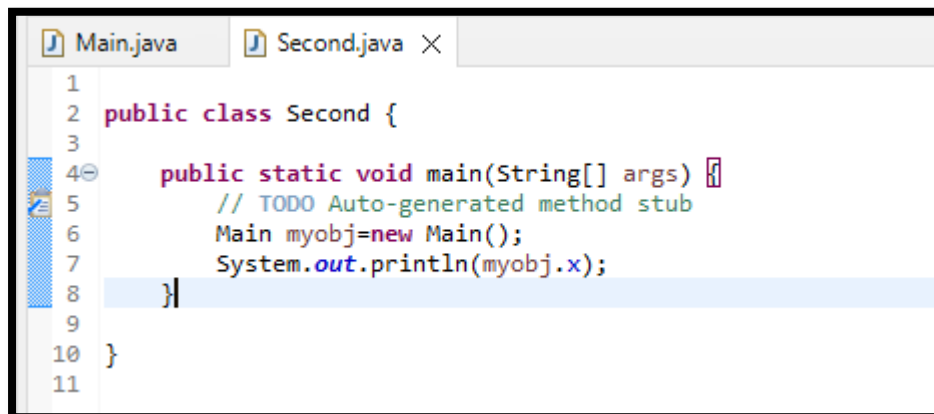
LAB EXAMPLES

EXAMPLE 1:



```
1
2 public class Main {
3     int x=5;
4 }
5
```

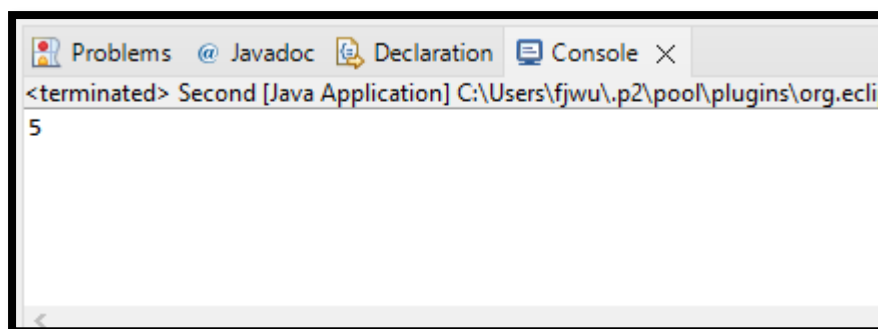
A screenshot of an IDE showing the Main.java file. The code defines a public class Main with a single attribute x of type int, initialized to 5. The line numbers 1 through 5 are visible on the left margin.



```
1
2 public class Second {
3
4     public static void main(String[] args) {
5         // TODO Auto-generated method stub
6         Main myobj=new Main();
7         System.out.println(myobj.x);
8     }
9
10 }
11
```

A screenshot of an IDE showing the Second.java file. The code defines a public class Second with a main method. Inside the main method, a new instance of the Main class is created and named myobj, and the value of myobj.x is printed to the console. The line numbers 1 through 11 are visible on the left margin.

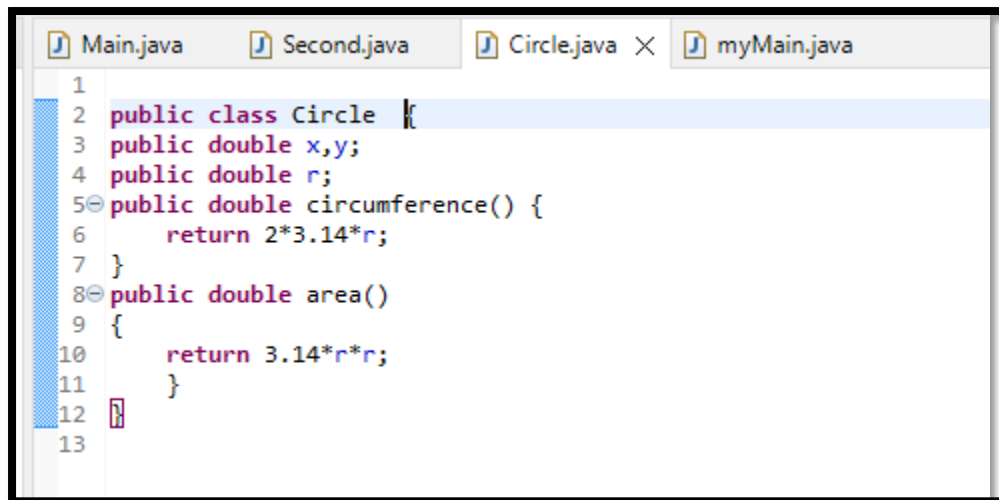
OUTPUT:



```
<terminated> Second [Java Application] C:\Users\fjwu\p2\pool\plugins\org.ecli
5
```

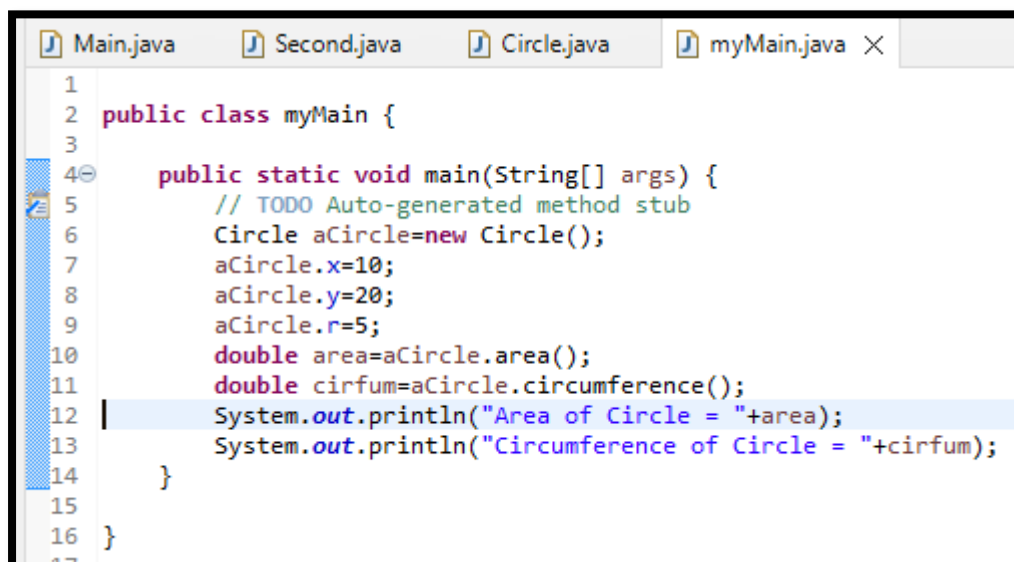
A screenshot of the IDE's console window. It shows the output of the program, which is the number 5. The window title bar includes tabs for Problems, Javadoc, Declaration, and Console. The console text shows the program has terminated and the output is 5.

EXAMPLE 2:



The screenshot shows the Eclipse IDE with four tabs: Main.java, Second.java, Circle.java, and myMain.java. The Circle.java file is active and contains the following code:

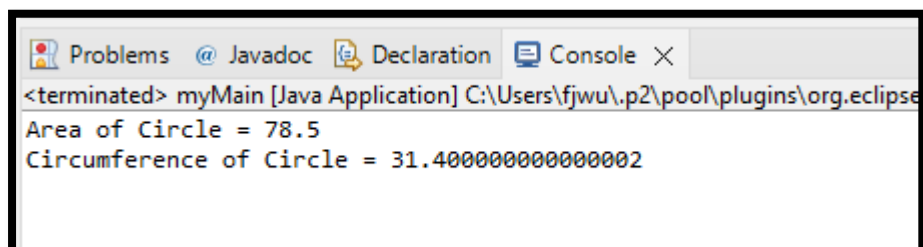
```
1
2 public class Circle {
3     public double x,y;
4     public double r;
5     public double circumference() {
6         return 2*3.14*r;
7     }
8     public double area()
9     {
10         return 3.14*r*r;
11     }
12
13 }
```



The screenshot shows the Eclipse IDE with the same four tabs. The myMain.java file is active and contains the following code:

```
1
2 public class myMain {
3
4     public static void main(String[] args) {
5         // TODO Auto-generated method stub
6         Circle aCircle=new Circle();
7         aCircle.x=10;
8         aCircle.y=20;
9         aCircle.r=5;
10        double area=aCircle.area();
11        double cirfum=aCircle.circumference();
12        System.out.println("Area of Circle = "+area);
13        System.out.println("Circumference of Circle = "+cirfum);
14    }
15
16 }
```

OUTPUT:



The screenshot shows the Eclipse IDE with tabs for Problems, Javadoc, Declaration, and Console. The Console tab is active and displays the following output:

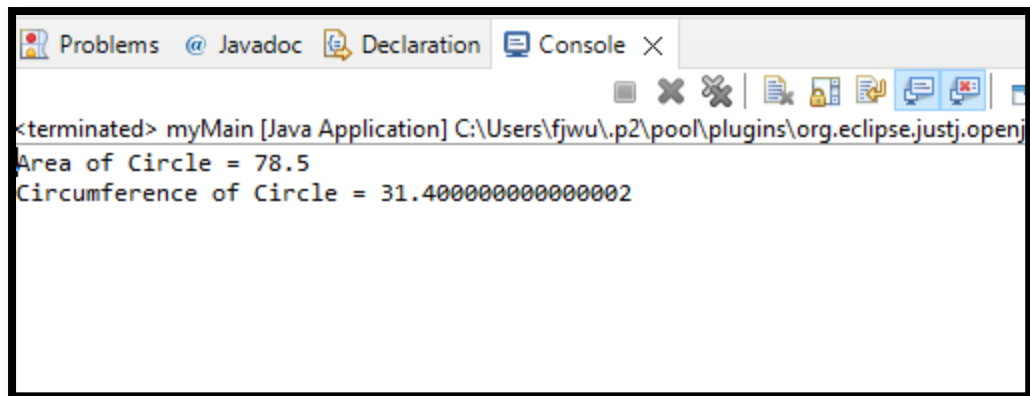
```
<terminated> myMain [Java Application] C:\Users\fjwu\p2\pool\plugins\org.eclipse
Area of Circle = 78.5
Circumference of Circle = 31.400000000000002
```

EXAMPLE 3:

```
Main.java Second.java *Circle.java X myMain.java
1 public class Circle {
2     public double x,y;
3     public double r;
4     public double getX() {
5         return x;
6     }
7     public void setX(double x) {
8         this.x = x;
9     }
10    public double getY() {
11        return y;
12    }
13    public void setY(double y) {
14        this.y = y;
15    }
16    public double getR() {
17        return r;
18    }
19    public void setR(double r) {
20        this.r = r;
21    }
22    public double circumference() {
23        return 2*3.14*r;
24    }
25    public double area()
26    {
27        return 3.14*r*r;
28    }
29 }
```

```
Main.java Second.java *Circle.java myMain.java X
1
2 public class myMain {
3
4     public static void main(String[] args) {
5         // TODO Auto-generated method stub
6         Circle aCircle=new Circle();
7         aCircle.setX(10);
8         aCircle.setY(20);
9         aCircle.setR(5);
10        double area=aCircle.area();
11        double cirfum=aCircle.circumference();
12        System.out.println("Area of Circle = "+area);
13        System.out.println("Circumference of Circle = "+cirfum);
14    }
15
16 }
17
```

OUTPUT:



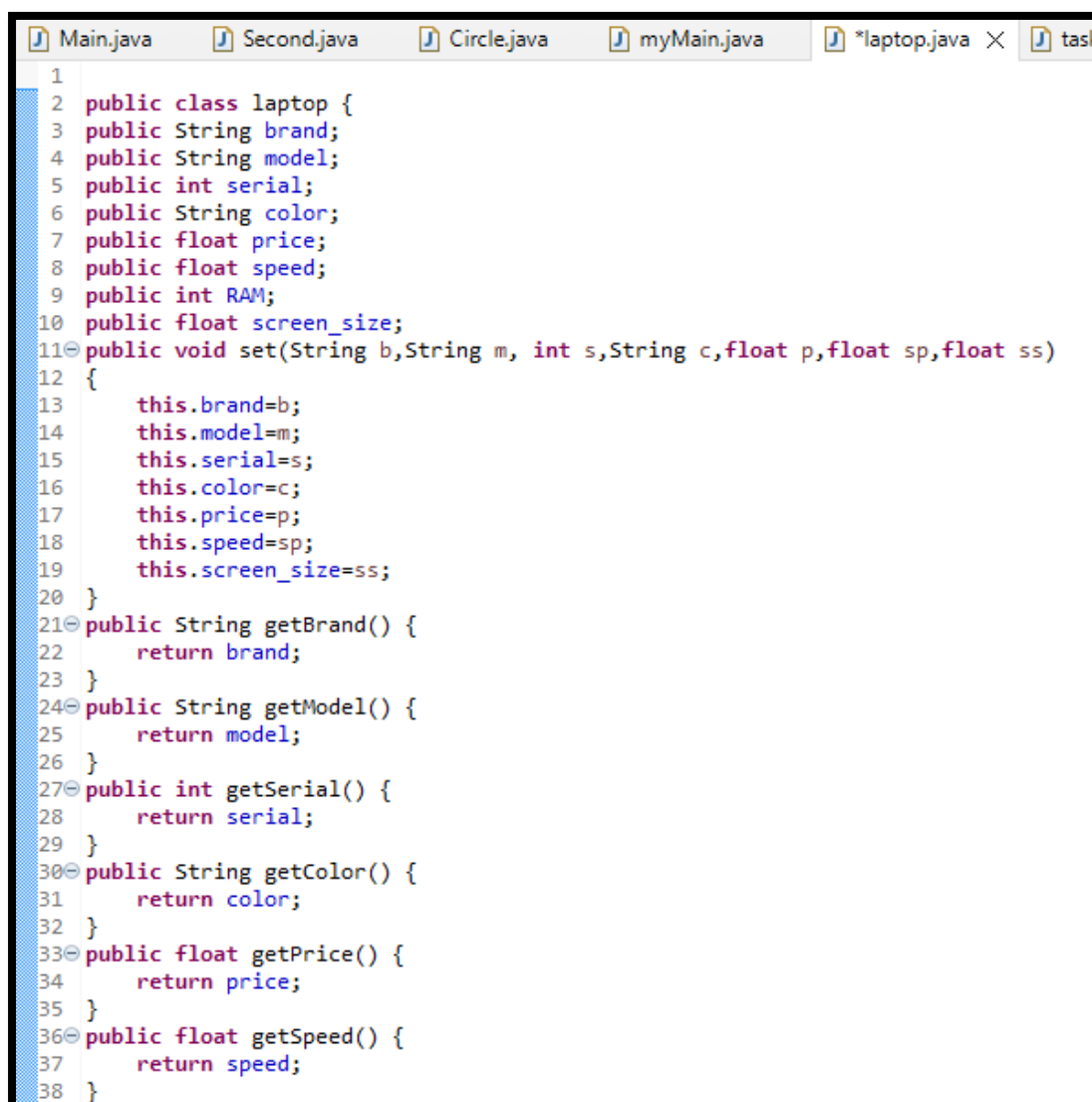
The screenshot shows the Eclipse IDE's Console window. The title bar includes tabs for 'Problems', 'Javadoc', 'Declaration', and 'Console'. The console text displays the termination of a Java application named 'myMain' and its calculated values for the area and circumference of a circle.

```
<terminated> myMain [Java Application] C:\Users\fjwu\.p2\pool\plugins\org.eclipse.justj.openj  
Area of Circle = 78.5  
Circumference of Circle = 31.400000000000002
```

LAB TASKS

TASK NO. 1:

Write a JAVA program that creates a class called laptop. The data members of the class are brand (string), model (string), serial (int), colour (string), price (float), processor speed (float), RAM (int), screen size (float). Create member function that will set the individual values. Since the RAM can be upgraded therefore create a function that allows you to upgrade the RAM only. In the end, create a function that will display all the data members.

A screenshot of a Java IDE window with multiple tabs. The active tab is 'laptop.java'. The code defines a 'Laptop' class with various attributes and methods. The code is as follows:

```
1
2 public class laptop {
3     public String brand;
4     public String model;
5     public int serial;
6     public String color;
7     public float price;
8     public float speed;
9     public int RAM;
10    public float screen_size;
11    public void set(String b,String m, int s,String c,float p,float sp,float ss)
12    {
13        this.brand=b;
14        this.model=m;
15        this.serial=s;
16        this.color=c;
17        this.price=p;
18        this.speed=sp;
19        this.screen_size=ss;
20    }
21    public String getBrand() {
22        return brand;
23    }
24    public String getModel() {
25        return model;
26    }
27    public int getSerial() {
28        return serial;
29    }
30    public String getColor() {
31        return color;
32    }
33    public float getPrice() {
34        return price;
35    }
36    public float getSpeed() {
37        return speed;
38    }
```

```

39 public float getScreen_size() {
40     return screen_size;
41 }
42 public void setRam(int r)
43 {
44     this.RAM=r;
45 }
46 public int getR()
47 {
48     return RAM;
49 }
50 public void display()
51 {
52     System.out.println("Brand = "+getBrand());
53     System.out.println("Model = "+getModel());
54     System.out.println("Serial = "+getSerial());
55     System.out.println("Color = "+getColor());
56     System.out.println("Speed = "+getSpeed());
57     System.out.println("RAM = "+getR());
58     System.out.println("Screen Size = "+getScreen_size());
59     System.out.println("Price = "+getPrice());
60 }
61
62

```

OUTPUT:

```

Brand = HP
Model = MP12D
Serial = 125
Color = Black
Speed = 25000.0
RAM = 8
Screen Size = 10.0
Price = 25.0

```

TASK NO 2:

Write a class called rectangle. Your task is to store the length and width of the rectangle. Write a member function called increment that will add 1 to the value of length and width. Also write a function that will compute the area of the rectangle. Finally write a constant function that will display the length, width and area of the rectangle. Demonstrate the use of the object in the main function. Make sure that the function names are meaningful and self-descriptive.

```
1
2 public class Rectangle {
3     int length;
4     int width;
5     public int getLength() {
6         return length;
7     }
8     public void setLength(int length) {
9         this.length = length;
10    }
11    public int getWidth() {
12        return width;
13    }
14    public void setWidth(int width) {
15        this.width = width;
16    }
17    public void increment()
18    {
19        this.length=length+1;
20        this.width=width+1;
21    }
22
23    public double area()
24    {
25        return length*width;
26    }
27    public void display()
28    {
29        System.out.println("Length = "+getLength());
30        System.out.println("Width = "+getWidth());
31        System.out.println("Area = "+area());
32    }
33
34 }
35
```



```
1  
2 public class task2 {  
3  
4     public static void main(String[] args) {  
5         // TODO Auto-generated method stub  
6         Rectangle r1=new Rectangle();  
7         r1.setLength(5);  
8         r1.setWidth(10);  
9         r1.increment();  
10        r1.display();  
11    }  
12  
13 }  
14 }
```

OUTPUT:

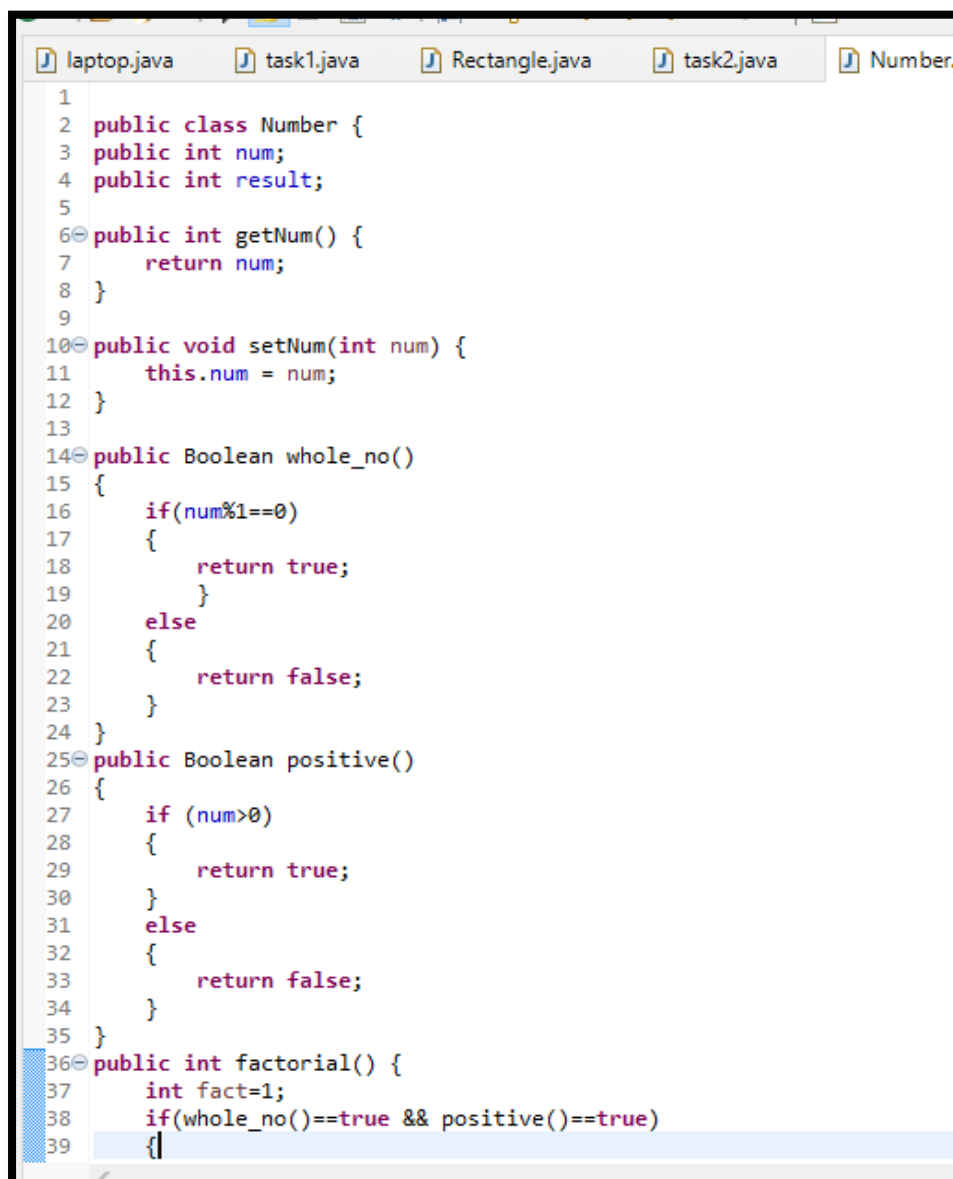
```
<terminated> task2 [Java Application] C:\Users\fjwu\.p2\pool\plugins\org.eclipse.ju  
Length = 6  
Width = 11  
Area = 66.0
```

TASK NO. 3:

Write a program that creates a class called number. Your class will have two data members namely num (float) and result (int). To find the factorial of the entered number you will need to design three functions as follows:

1. Function to determine if a number is a whole number or not
2. Function to determine if the number is positive or not
3. Function to find the actual factorial
4. Function to display the number and its factorial

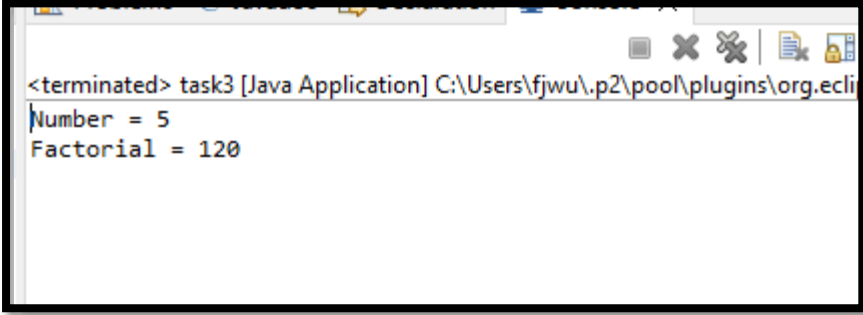
Remember that to find the factorial the number must of positive and a whole number. So if any of these conditions are not met then you cannot determine the factorial



```
1
2 public class Number {
3     public int num;
4     public int result;
5
6     public int getNum() {
7         return num;
8     }
9
10    public void setNum(int num) {
11        this.num = num;
12    }
13
14    public Boolean whole_no()
15    {
16        if(num%1==0)
17        {
18            return true;
19        }
20        else
21        {
22            return false;
23        }
24    }
25    public Boolean positive()
26    {
27        if (num>0)
28        {
29            return true;
30        }
31        else
32        {
33            return false;
34        }
35    }
36    public int factorial() {
37        int fact=1;
38        if(whole_no()==true && positive()==true)
39        {
```

```
37     int fact=1;
38     if(whole_no()==true && positive()==true)
39     {
40         for(int i=1;i<=num;i++){
41             fact=fact*i;
42         }
43     }
44     return fact;
45 }
46 public void display()
47 {
48     System.out.println("Number = "+num);
49     System.out.println("Factorial = "+factorial());
50 }
51 }
52
```

OUTPUT:



<terminated> task3 [Java Application] C:\Users\fjwu\.p2\pool\plugins\org.ecli
Number = 5
Factorial = 120